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The Journal of **The Biblical Creation Society**

Origins 57

Editorial:

Secularist challenges to liberty of conscience

During September this year, there was media interest in a pregnant woman who aborted her own baby days before it was due to be born. The legal issues were considered by Sir Jeremy Cooke, a senior judge. The woman was told that there was no mitigation available to her under the 1967 abortion act and she was sentenced to 8 years in jail. The judge told her that "all right thinking people" would view what she had done as second only to murder.

Despite clear statements from Mr Justice Cooke that he was implementing the law of the land, the Executive Director of the National Secular Society (NSS) was quick to voice unease. The issue was said not to be this particular case, but the judge's participation in the Lawyer's Christian Fellowship (acting in the past as a vice-president) and previous opposition to the culture of "abortion on demand". The NSS expressed alarm at the Lawyer's Christian Fellowship declaring that it was dedicated to "applying God's justice on the ground". Secularists take every opportunity to drive a wedge between religious principles" and "democratically agreed, human rights-compliant law". We would welcome a high profile informed discussion of these issues (particularly of the weight given to case law by the legal profession), but neither politicians nor the media appear willing to allow informed Christians a platform in the public arena.

Our culture will tolerate Christianity when it is perceived as a personal, cloistered belief system, but there are no concessions to Christianity as a mature worldview, with implications for every aspect of public and private life. As another example, there are numerous leading politicians who want to redefine marriage so that it conforms to the stance they have taken on gender discrimination. None of these leaders take the time to explain the intellectual and historical background to the marriage covenant and none of them appear to welcome informed contributions from Christians. Instead, we get the mindset that democracy is OK as long as people at large agree with the secularist elite. If the community does not share their values, it is considered to be afflicted by prejudice and superstition, and greatly in need of enlightenment from the philosophies of secular humanism.

Over the past year, we have witnessed a hardening of education policy about the way dissent in science is treated. Many teachers used to find dissent to be a useful didactic tool, as the arguments for and against could be evaluated. A number of Christian schools have applied to become free schools, but guidelines have been issued that not only prohibit all reference to design and creation concepts in science education, but also make these no-go areas for any other part of the curriculum. This is found in section 24A of the "Mainstream Free Schools model Funding Agreement". This paragraph reads:

> "The Academy Trust shall not make provision in the context of any subject for the teaching, as an evidence-based view or theory, of any view or theory that is contrary to established scientific and/or historical evidence and explanations."

The wording, although not explicitly mentioning creationism, was targeting schools who might be tempted to give students some alternative perspectives on the subject of origins. (The wording is badly thought through, as teachers could be faced with challenges to their professionalism for introducing perspectives on global warming or GM foods that question the so-called consensus in science.) The wording was the result of a campaign mounted by the British Humanist association (BHA) and the NSS to counter any dissent to evolutionary theory, and these organisations have trumpeted their lobbying success.
BHA Chief Executive Andrew Copson commented:

> "We congratulate the government for taking this significant step to prevent creationist Free Schools. There is still further work to be done to ensure that all schools, not just Free Schools, are prevented from teaching creationism, to include evolution in the primary National Curriculum, and to ensure evolution's teaching in all schools. We look forward to working with the government and all those who care about rational and evidence based education to achieve these additional changes."

Although it is tempting to dwell on the bleakness of this situation and mourn the encroaching tsunami of secularism, it is important for us to find encouragements from history as well as from God's dealings with us today. 2012 is the 350th anniversary of the Great Ejection, which some consider to be the beginning of nonconformity in Britain. On St. Bartholomew's Day, 24th August 1662, about 2000 ministers and academics were forced to leave their places of service within the Church of England. They left for conscience sake. They could not submit wholeheartedly to everything that was written in the *Book of Common Prayer.*

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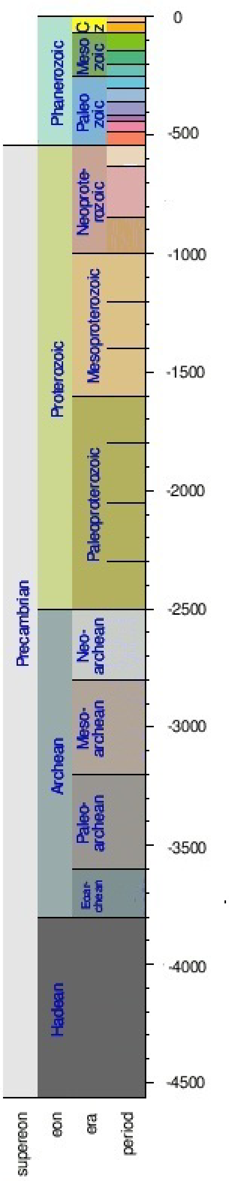
Recolonisation and Earth History

Further reflections on the 50th Anniversary of *The Genesis Flood*

David J. Tyler



The conventional geological column, with commonly assigned dates in millions of years (Cz, Cenozoic).

The publication of *The Genesis Flood* was a landmark in the history of creationism. It was a signpost for a whole generation of Christians who were searching for a way to reconcile biblical history and the Earth sciences. I write from personal experience: I had come first to accept the historicity of Adam and Eve after studying Romans 5-8, and came to recognise that the accounts of Creation and the Flood are historical narratives after working my way through Genesis 1-11. It was at this point that I realised the significance of Whitcomb and Morris' book – and devoured it enthusiastically.

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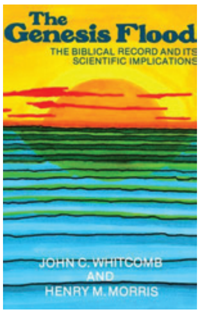
The first part of the book deals with the interpretation of the early chapters of Genesis. I found this eminently satisfying, reinforcing my newly acquired understanding of biblical history and developing it in ways that were exciting and inspiring. The second part was concerned with geological evidences, and the effect was similarly intellectually invigorating. The general argument was not that the geological evidences were wrong, but that the interpretations placed on these data were unwarranted. Whitcomb and Morris (hereafter W&M) showed how a catastrophist approach to Earth history was far more concordant with the data than prevailing views. The effect on my thinking was profound. It was a striking example of what Thomas Kuhn called a paradigm shift, and it enabled me to develop a new conceptual framework for my personal understanding of the Earth sciences. In subsequent years, this became very important as I deepened my knowledge of geology, both theoretically and practically (via fieldwork).

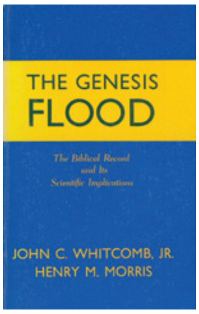
Paul Garner's (2011) helpful overview article appeared in Origins 55. He pointed to the significant work of establishing a biblical base on which to build geological thinking, critiquing uniformitarian geology, and developing a framework for Diluvialist geology consistent with biblical timescales of history. In a constructive way, attention was drawn to geological interpretations made by W&M that have needed revision.

This article presents biblical material that points to conclusions that take us beyond the diluvialist model advanced by W&M.

Flood models

Numerous "model builders" have emerged since W&M, revealing a diversity of creationist views about Earth history.


The Genesis Flood
THE BIBLICAL RECORD AND ITS SCIENTIFIC IMPLICATIONS
JOHN C. WHITCOMB AND HENRY M. MORRIS



Some of these are discussed by Sarfarti (2010). His main point is that we must distinguish between scientific models and biblical revelation. The Bible provides us with authentic history and this history provides a framework for us to interpret the data of science. However, we must not elevate our scientific work so that it carries the same authority as Scripture. All science has to be tested by evidence and our theories are only as good as their correspondence with data.

This article is concerned with the fit between theory and empirical evidence, but even more with a biblical framework for structuring our thinking. In particular, we shall consider whether the Bible portrays the Flood as an event that was far more dramatic than was envisaged by W&M.

The Flood as a catastrophic event

The biblical witness to catastrophism is compelling. Whilst some scholars have suggested a tranquil flood, leaving no geological remains, very few have been convinced. The four arguments below are at the top of my list.

The onset of the Flood was sudden. A 7-day period was allowed for the ark to be populated and prepared for the cataclysm (Genesis 7:10). Then, Noah and his family went into the ark and the Lord shut them in (Genesis 7:16). The Flood came that very day. Noah did not have to wait weeks for the waters to rise sufficiently to lift the ark off the ground. He did not have to listen to people hammering on the door to be let in – they were all swept away on "the day" the Flood commenced.

The testimony of Jesus Christ. The Lord Jesus referred to the Flood account as an analogy of the end of the Age and the coming of the Son of Man in judgment. The end will be sudden and overwhelming. Two will be in a field – one taken and the other left. There is no stretching out of the "coming" over weeks and months.

The breaking up of the fountains of the deep. The key driver of the Flood was not rainfall, but the release of waters from the crust of the Earth. Subterranean waters were accompanied by 40 days of torrential rain (Genesis 7:12), but the violence of the Flood came as a consequence of tectonics. Whatever else is said about this mechanism, the geological effects would necessarily have involved subsiding tectonic blocks being flooded over very short timescales (hours) and giant tsunamis sweeping over land surfaces. As crustal plates moved vertically, flood-waters moved laterally under the influence of gravity with extensive erosion, followed by basin-wide deposition of sediments (Tyler, 1990).

The Hebrew word for the Flood: the *mabbul.* There are several words in Hebrew for floodwaters, but the word *mabbul* is used exclusively to refer to the Flood that occurred during the life of Noah. Specifically, it refers to the promised destruction during the 40 days and nights of rain (Genesis 7:4,16). In the New Testament, the word *kataklu* is used when referring to Noah's Flood (Matthew 24:38-39, Luke 17:27, 2 Peter 2:5), conveying the sense of violent destruction. This Greek word is the root of our word "cataclysm". Further discussion is provided by Robinson (1998) and the issues were explored by Fouts & Wise (1998) and Robinson (2000).

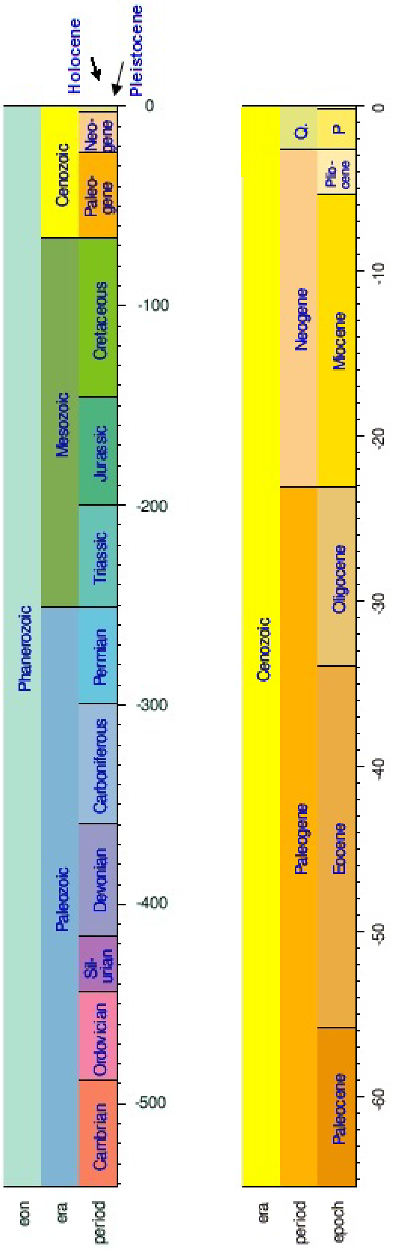
The implications of catastrophism of this magnitude are discussed in this article.

The chronology of the Flood Year

W&M provided a table outlining the chronology of the Flood. They acknowledged that differences of view are found among scholars and discussed many of these. In the comments below, I follow the chronology presented by W&M. This is essentially the same as that presented in Kidner's (1967) commentary on Genesis.

The 40 days of torrential rain (days 1-40). The outpouring of rain marks the *mabbul* and portrays an intensity of destruction. Most readers of the Bible, including the people living as contemporaries of Moses, would be familiar with flash flooding and the power of moving water. We should remember that a cubic metre of water weighs a ton, so a torrent of water of even a few metres in cross-section can move mighty boulders, uproot trees and cause utter devastation. This was the promised judgment upon sinful humanity along with the Earth and air-breathing animals (Genesis 7:13). This phase of the Flood year involved the breaking up of the Earth's crust and was characterised by unparalleled violence and destruction.

The prevailing waters during the next 110 days (days 41-150). The waters flooded the Earth until day 150 (Genesis 7:17-24). It is not necessary to suppose all the land was covered with



More detailed divisions within Phanerozoic time (left) and Cenozoic time (right). This article considers the structure of the column to be valid, but not the assigned dates (Q, Quaternary; P Pleistocene).

Dinosaur Footprints.
© Klaus Nilkens, www.istockphoto.com

water continuously from day 1, but total immersion was achieved by day 40. After this, tectonic movements reduced in intensity and the word *mabbul* is no longer used to describe events.

The grounding of the ark and recession of the floodwaters (days 151-264). The ark came to rest but the inhospitability of the terrain was apparent. After a lengthy wait, Noah sent out a raven to see if anything could be learned. This phase initiated the drying out of the Earth and the recolonisation of terrestrial ecosystems by plants.

The raven and the dove (days 265-285). After the raven, Noah sent out the dove three times. On the first occasion, the dove was not able to find what it was looking for, so it returned to Noah. The second time, it returned with an olive leaf. It did not return after the third release.

Drying winds and preparations to disembark (days 286-371). Noah removed the covering from the Ark and was able to better appreciate the drying of the land and the regrowth of plants. Then, at God's command, the family group and the animals left the ark and entered the antediluvian world.

Having a clear chronological foundation is important for guiding our thinking about rocks, fossils and Earth history. This is a fundamental issue for biblical creationists: if we ignore revealed truth, we are likely to go astray in our interpretations of empirical data. Similarly, we are on shaky ground if we are selective about what parts of revealed truth we embrace. It appears to me that this is what is happening with the chronology of the Flood year and further discussion is provided below.

The interpretation of geological data

The issues raised in this section have been discussed for over 15 years in articles in *Origins* and other publications, and in past workshops of the BCS Earth Sciences Group. They are of continuing relevance because the responses received have been inadequate.

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The *mabbul* destruction: sudden and overwhelming. The timescale for the floodwaters to impact all terrestrial environments must be short: measured in hours and days. The effusion of water from the "fountains of the deep" implies that water came up from below through fissures associated with the breaking up of the Earth's crust. Consequently, the pre-Flood elevation of ecosystems above sea level should not be considered relevant. However, many Diluvialists still work with models invoking steadily rising sea levels that encroach on the land. They have adopted this approach because they want to explain fossil successions – and they argue that fossil successions demonstrate the sequence: marine animals, amphibians, reptiles, birds and mammals. To explain the sequence, they invoke the successive flooding of ecosystems by rising floodwaters. They also invoke the concept of differential mobility: slow moving animals cannot get away from the waters, but agile animals, particularly birds and humans, are the last to be overwhelmed and fossilised. Some diluvialist models have land animals surviving up to 40 days, and others stretch the timescale to 150 days. Such scenarios conflict with both the suddenness of the *mabbul* destruction and the chronological information we have in Scripture.

The *mabbul* destruction of the Earth. God had said to Noah: "I am going to put an end to all people, for the Earth is filled with violence because of them. I am surely going to destroy both them and the Earth" (Genesis 6:13). This judgment was to fall on the Earth for the same reason that God cursed the ground in Genesis 3:17. It was because Adam and Eve were created in the image of God, and part of that image was to have dominion – over the animals and over the Earth itself (Genesis 1:26). The judgment fell on mankind and upon all the domains over which they had been given dominion. The Earth was destroyed, not merely given a face-lift.

The *mabbul* destruction of air-breathers. Fossil evidence of air-breathing animals should be of particular interest to diluvialists. There are two types of evidence: body fossils and trace fossils. Trace fossils include tracks, trails, burrowings and constructions (such as nests). These fossil remains provide information about feeding behaviours, movements (such as migration), and the raising of young. The critical point is that trace fossils relate to a time when the animals were still alive. They were still breathing air! This means that the strata containing traces of air-breathing animals cannot be assigned to the period between the *mabbul* and the migrations from the ark. Many diluvialists divide the rock record into the inundatory stage and the recessive stage (Walker, 1994). They link the fossilised traces to rising floodwaters in the inundatory stage, with animals fleeing to places of greater safety. This typically requires air-breathers to be moving around on thousands of metres of sediment that floodwaters had previously deposited. When this approach is followed, preflood ecosystems and surface topographies become irrelevant because they are all buried under vast thicknesses of sediment. But more needs to be said, because the strata above these traces typically contain more traces. Trace fossils of air breathers are found throughout the rock systems of the Mesozoic and Cenozoic – the upper part of the sedimentary record. There is no "barren" zone above the extensive record of dinosaur tracks. Consequently, to find sediments from the flood year, we must look below the Mesozoic system. This argument was clearly set out by Garton (1991, 1996).

Air-breathers in the fossil record. The suddenness of the *mabbul* does not allow for an extended period (of weeks or even months) for animals and humans to be running about trying to escape rising floodwaters, nor for dinosaur nests to be constructed nor for eggs to be laid in those nests. There are extensive dinosaur tracks in Jurassic and Cretaceous strata and above them can be found Cenozoic strata with mammal and bird trace fossils. Above these in the rock sequence are Quaternary sediments associated with glacial or interglacial environments, again containing traces left by air-breathing animals, which W&M and most diluvialists assign to the post-Flood period. There is a real problem here for the W&M model, because this pattern means that the preserved 'Flood sediments' must all be assigned to the initial phase of the Flood. For example, this constrains the thinking of Froede (2010) regarding trackways in rocks from the Appalachian Mountains. He concludes they represent early Flood activity, despite the traces being found in strata from the Lower Pennsylvanian to the Lower Cretaceous. We shall return to the problems this creates for a coherent flood model, but we note here that Froede's approach makes no sense geologically, because continental-scale flooding must accomplish extensive erosion and deposition. Above the tracked horizons, Froede and his colleagues need to identify a part of the fossil record that is barren of traces of air-breathers – but this is not something they have been able to do. The missing barren strata is a fundamental flaw in their model; almost as unbelievable as the tranquil flood theory!

The recolonisation approach

A different perspective. Some of us have approached the problem by starting with post-Flood sediments in the Quaternary and then working down the geological record. The traces of air-breathers in the glacial sediments mean that migrations from the ark preceded the deposition of these sediments. In the Cenozoic, we find evidences of avian and mammalian recolonisation of the Earth. In the Mesozoic, we find smaller numbers of mammals and birds, but plenty of evidence for reptiles including the dinosaurs. This leads to the conclusion that dinosaurs were pioneer recolonisers spearheading migrations away from the ark. There are a few hints of air-breathers earlier than this, but the pattern is clear. Most of the Palaeozoic is barren of air-breathing animal traces and this situation continues down into Precambrian strata. In fact, we do not find traces of air-breathers in the Precambrian at all, and the inference is made that any traces of animals living when the *mabbul* commenced have been destroyed along with their body fossils. This scenario for understanding the fossil record considered as a whole is explained in more detail by Tyler (2006) and an accessible web resource is by Robinson (2012).

Recolonisation is the key to interpreting patterns in the fossil record. Recolonisers view the fossil sequences in terms of ecological succession. The hot waters characterising the earliest Precambrian could not support marine animals because hot water has so little oxygen dissolved in it, and the chemistry of the continental Precambrian seas was not conducive to life. So what we find are single-celled extremophiles. But some of these were algae that could photosynthesise, thereby providing a pathway for environmental change. As waters cooled, oxygen levels increased and seawater chemistry was modified, so animals could return from refugia far from land masses and colonise the shallow-water aerated seas. This triggered the Cambrian Explosion. Marine ecosystems developed rapidly, with expanding food chains, culminating in recolonisation by fish. Research papers appear regularly that demonstrate the effectiveness of this ecological understanding of the fossil record. Examples include: evidences for vegetated land in the late Precambrian, liverworts as the earliest known land plants, the pattern of diversification of vertebrate groups and angiosperm plants, and planktic foraminifera. These have been addressed in the past few years in research papers by authors working within the conventional paradigm and are discussed by Tyler (2012).

Differing perspectives on the Geological Column. W&M recognised that the sequence of fossil appearances is not random and therefore needs to be explained. Their response was to advance explanations using the concepts of ecological zonation and differential mobility. There are numerous problems with this approach, and Robinson (1997) has provided a robust critique. Significantly, W&M never subjected their hypothetical explanatory mechanisms to systematic testing. The model never got beyond the anecdotal level – and this continues to be the situation today. Nevertheless, this diluvialist model is still advanced by many who seek to explain the fossiliferous geological record by the 1-year Flood. These mechanisms appear to provide a broad brush explanation of the fossil record, but there are major problems with the details. Consequently, these diluvialists suggest the geological column construct lacks substance (Oard, 2010c, Matthews, 2012). They will recognise thousands of local columns, but claim it is not possible to correlate them. It follows that each local column needs a separate interpretation. They take the stance that there is no need to explain anything that presupposes a non-existent geological column. Consequently, this approach to geology tends to look very fragmented. Arguments drawing on stratigraphical correlations are instinctively dismissed as being fundamentally flawed. My response to this whole issue is to point out that successions in fossils are accompanied by successions in lithologies (rock types). When fossils and lithologies are combined as evidence, continent-wide systems can be readily identified. Fuller discussions of the principles of establishing correlations between local columns are by Robinson (1997) and by Tyler & Coffin (2006). A positive statement concerning the geological column by a group of Diluvialists was published in *Origins* (Snelling *et al.* 1997) and elsewhere.

Locating Flood boundaries.

There has been considerable discussion among Diluvialists to identify both the pre-Flood/Flood boundary and the Flood/post-Flood boundary and the significance of the tracks of air-breathing animals has more recently become recognised.

Many diluvialists have focused attention on identifying the boundary between pre-Flood rocks and Flood rocks. They consider that basement rocks of the Earth are essentially created rocks, with perhaps a metamorphic overprint or some structural deformation. Those developing the W&M model have favoured the Great Unconformity at the base of the Cambrian as the key marker for the onset of the Flood. However, these basement rocks below the unconformity bear the marks of a catastrophist history of formation which raises questions about whether they can be seriously considered as created rocks. If the *mabbul* destruction is to guide the premises we make, then the antediluvian Earth was destroyed and the basement rocks of the Earth display this destruction. Such a scenario fits well with the analysis of Hunter (1996), who put the onset of the Flood boundary deep in the Earth's crust, because all basement rocks witness to a catastrophist past.

Regarding the Flood/post-Flood boundary, W&M located this towards the top of the geological column, at the Pliocene/Pleistocene boundary. The glacial deposits of the Quaternary were considered to have been laid down soon after the Flood in a period of climatic instability. Discussion has focused on two alternatives: the boundary suggested by W&M and the end-Cretaceous boundary favoured by advocates of Catastrophic Plate Tectonics (CPT). Oard (2010a, 2010b, 2011) defends the Pliocene/Pleistocene boundary and interprets fossilised traces of air-breathing animals as having been made during the inundatory stage of the Flood. Oard considers that numerous land animals survived the 40-day *mabbul,* and continued on into the 110 days of "prevailing": "Like dinosaur tracks, bird and mammal tracks [. . .] represent animal activity during the Flood, before Day 150. Such tracks were made on "briefly exposed diluvial sediments" (BEDS) during fluctuations in relative sea level during the Flooding Stage." (2010b, p.91). Froede (2012) uses fossil trackway data to make the same point. As an initial response, Ross (2012) has analysed fossil data representing 303 genera from 28 terrestrial mammalian families from North America. He was particularly interested in genera and families that cross the Pliocene/Pleistocene boundary to establish whether there is continuity or discontinuity. He found 23% of genera cross the boundary and > 96% of families, and concluded that the evidence does not support the Pliocene/Pleistocene boundary hypothesis. Instead, "a lower location for the boundary must be sought" (p.87).

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> "Oard considers that numerous land animals survived the 40-day mabbul, and continued on into the 110 days of "prevailing": "Like dinosaur tracks, bird and mammal tracks [. . .] represent animal activity during the Flood, before Day 150."

On the interpretation of the Cenozoic, recolonisers share a common approach with the CPT advocates. These rocks are all part of the post-Flood recolonisation story. Some representative studies are as follows: the John Day Country (Nevins, 1974); the Green River Formation (Garner, 1997); the North Atlantic Igneous Province (Tyler, 2003a); the fossil record of horses (Garner, 1999). German speakers can consult a whole book on the subject by Scheven (1988).

Moving lower into the Mesozoic, recolonisers are alone in finding a post-Flood scenario with a pattern of ecological successions with an unstable Earth recovering from the global catastrophe. Representative studies concern the UK Jurassic series (Tyler, 1994); the Spanish Mesozoic (Garton 1997); chalk deposits (Tyler, 1996, 2006b); and the UK dinosaur trackways (Tyler, 2003).

The Palaeozoic System has been handled in different ways by recolonisers. Perhaps the most striking differences relate to the Carboniferous Coal Measures. Scheven (1984; 1996) considers these to be late Flood deposits, whereas others consider the coal forests to be part of the recolonisation story. The need here is for more field-based research to test alternative hypotheses for observational data.

The Precambrian rocks have numerous distinctive characteristics and are not just rocks lacking hard-bodied fossils. Some of these features are discussed by Tyler (2005; 2006a) and Robinson (2012 – see "The Hadean Cataclysm").

The relevance of the recolonisation approach for education and research.

There are important issues here for all students of geology. Britain is uniquely placed to display the concept of the Geological Column. It is possible to "walk through" most of the Palaeozoic by visiting outcrops in Wales. A similar exercise for the Mesozoic can be undertaken in England, as for example, along the coastline of Devon and Dorset. Most British geologists are not impressed by the idea of independent local columns, because correlation using lithologies and fossils has been found compelling for over 200 years – since the days of William Smith. The UK has a 'local column' that looks remarkably like the conventional geological column! Since much field work revolves around mapping rock formations, identifying structural deformations and establishing sequences of rock units in an area, recolonisers have no inhibitions about participating fully in establishing the database from which interpretations are made subsequently.

Differences with other geologists come when the task is to interpret the mode of formation of the rocks and explain the fossil successions. This is where opportunities can be found for interacting constructively with mainstream geologists. Many of the concepts held by recolonisers are already accepted (in principle) by the academic community (e.g. neo-catastrophism, ecological succession as an explanatory framework, tectonically-controlled processes). It is possible to argue the case for these concepts by going into the field and appealing to evidences. Those of us with interests in the Earth sciences should learn to distinguish between biblical revelation and diluvialist models, and then we should be testing out our ideas by reference to multiple working hypotheses. This is the spirit of W&M's classic book, and this is what following in their footsteps should mean for contemporary creationists. ■

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Irreducible design and overdesign in man: a case study of man's upright stature and mobility

Professor Stuart Burgess

Irreducible design and overdesign

One of the unique features of intelligent design (as opposed to evolution) is that it is possible to produce irreducible design and over-design. Irreducible design is where several components and several pieces of design information are required to be present simultaneously for a mechanism to have a useful function (Burgess, 2000). When irreducible design is present in nature this presents a serious challenge to evolution because evolution is not able to generate many pieces of specific design information simultaneously.

Over-design means adding features that are beyond what is required to adequately function (Burgess, 2000). Engineers like designing expensive cars like Jaguars and Porches because they have the freedom to create luxury, comfort, aesthetics and levels of performance way beyond what is actually required to get a car from A to B. In contrast to intelligent design, evolution cannot produce over-design. Evolution is based on the principle that living organisms have just enough functionality to survive. In other words, if life has evolved, every feature of an organism must have some survival advantage. Organisms cannot have design features that are there just for the sake of impressive design.

X-ray image of running man.
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When over-design is seen in the natural world, it creates a big challenge for evolutionists because they are unable to give a survival reason for the design. Examples of over-design in the human being include upright mobility, skilful hands, fine skin, facial expressions, intricate language and intelligence (Burgess, 2000; 2004 and 2008). If man had evolved just to be hunter-gathers then you would not expect such an over-designed body and intelligence. If man was just a naked ape you would not expect man to be able to compose and play music to such extreme levels of precision and beauty. And you would not expect man to be able to play sports like tennis and gymnastics with such grace and skill. Of course animals are intelligent and agile to some degree. But humans have a unique design that is way beyond what is needed to survive.

Upright stature

This article focuses on man's upright stature and shows how it is unique and an example of over-design. There are around 4,000 mammals and yet humans are the only bipedal mammal. One of the reasons why apes are very different to humans is that apes are quadrupeds whereas humans are bipeds. The human body has many features that are intricately designed for an upright stature. The upright stature of humans gives them an amazing all-round mobility that is superior to every other creature. Man is the only creature capable of extremely skilful balance on two legs.

According to evolution, humans have gradually evolved an upright stature over millions of years for survival reasons. However, to be able to stand upright, humans need many design features that are not present in quadrupeds and many of these must be in place simultaneously. There are so many special features required for bipedal motion that it is impossible for a quadruped to evolve gradually into a biped. The unique design features required for an upright stature are explained in the following sections.

(1) UNIQUE ARCHED FEET

Humans have a unique arched foot. The arched foot is strong enough to support the body yet flexible enough to allow agile movement on two legs. The main arch in the foot is between the heel and the ball of the foot. There are actually three arches and three points of contact with the ground (Kapandji, 1995). One point of contact is in the centre of the heel, a second point of contact is on the ball of the foot near the big toe and a third point of contact is located on the ball of the foot near the little toe. The three arches extend between these three points of contact (there are two arches between the heel and the ball of the foot and one arch across the ball of the foot).

The triple arch structure of the foot means that there are three well-defined points of contact with the ground. It is well known in engineering that the most precise way of supporting an object is to have three points of contact. The arched foot has such a clear interface with the ground that it is possible for humans to stand on one leg with ease. When balancing on one leg, the centre of gravity of the body can be placed within the three points of contact of the foot to give a steady balance. The human foot has 26 precisely shaped bones, together with many ligaments, tendons and muscles. Several of the bones are wedge-shaped so that a strong arch is formed.

Arched feet are very important for an upright stature because they allow fine control of the position of the body over the feet. When standing upright, a person can maintain forward balance by adjusting the relative pressures on the heels and balls of the feet. If anything disturbs the balance in the forward direction whilst standing, corrective action can be carried out by leaning more on either the front or the back of the feet. Sideways balance can be achieved by adjusting the relative pressure on the root of the big toe and the root of the little toe.

A very important feature of the human foot is that it is an irreducible structure. This means that there are several parts in the foot that must be in place and correctly designed before the foot can function properly. In other words, the human foot cannot evolve step by step from another structure like a hand. It is well known in engineering that an arched structure is an irreducible structure. One reason why an arched structure is irreducible is that an arch needs to be a minimum height before it can be strong enough to take a load. Only when a distinct high arch is fully in place can the arch perform its function of carrying a load. In addition, an arch needs the right components like a keystone, wedge-shaped blocks and staples to be in place to work. Since the human foot has parts equivalent to a keystone, wedge-shaped blocks and staples, the human foot must be an irreducible structure. Only an intelligent designer has the ability to think ahead and plan all the features needed to make an arch like the foot.

The arched structure of the human foot is a perfect design for giving humans upright mobility. In contrast to humans, apes have very flexible feet that are effectively a second pair of hands for gripping branches. In consequence, apes have very limited abilities for standing and walking.

> “The arched structure of the human foot is a perfect design for giving humans upright mobility.”

(2) STRONG BIG TOES

Humans have a unique strong big toe on each foot that is close to the other toes. This feature is important for walking and running because the final push from the ground comes from the big toe. In order to propel the body forwards in a controlled manner, the big toe must be very stiff and strong. In contrast to humans, the big toe of apes is like a flexible thumb that is designed for gripping branches. When apes attempt to walk with an upright stature, they cannot make a firm push from their big toe.

(3) LONG LEGS

Humans have long legs and short arms whereas apes have short legs and long arms. The arms of apes must be longer than their legs because the hands must reach the ground to allow quadruped movement on land. It is important to note that long legs would be a hindrance to an ape that could not already stand upright. The reason for this is that if an ape started to develop long legs before it could stand upright, it would find it very difficult to walk on two or four legs.

(4) UPRIGHT KNEE JOINTS

The human knee joint can extend fully so that the leg can be made straight and the body upright. In fact, the human knee joint also locks in the upright position. This feature makes standing easy because the muscles do not need to be kept in tension. In contrast, the knee joint of apes is not fully extendable and apes must always have bent legs.

(5) ANGLED FEMUR BONES

When looking from the front, humans have femur bones that are angled inwards as they come down from the hip joints to the knees. This has the effect of making the knees close together and the feet close together. Having feet close together keeps the feet nearly under the centre of the body and this gives stability during walking and running. During walking and running, the body is supported by only one leg at any instant in time and so the body can easily topple over if the legs are not right under the body. If the feet were not close together during walking and running, then the body would be thrown from one side to the other as the body landed on each foot.

In contrast to humans, the femur bones of apes drop down vertically, making the knees relatively far apart and the feet far apart. When apes try to walk on two legs, it can be observed that they sway awkwardly from side to side as they try to maintain balance. Apes must have feet spaced wide apart because this gives stability in quadruped motion. The angled femur bone of humans also helps to explain why humans are able to stand on one leg.

(6) UPRIGHT HIP JOINTS

Humans have unique hip joints that give an upright stature. In particular, humans have a pelvis that allows a completely natural walking motion. In technical terms, the human hip joint is fully extendable. In contrast, the hip joints of apes cannot fully extend to the upright position and apes must always have bent legs even if they stand on two legs. Another important feature of an upright hip joint is that it is of no use if there is no upright knee joint. If an ape had upright hips without upright knees, it would be in danger of falling backwards when straightening its legs. On the other hand, if an ape had upright knees without upright hips, it would be in danger of falling over forwards when straightening its legs.

(7) STRAIGHT BACK

The human spine is slightly undulating and has the unique shape of the letter 'S'. In contrast, the spine of apes is bent in the shape of the letter 'C'. The straight back of humans is ideal for an upright stature because the torso and head are directly above the hips in the standing position. In contrast, the curved back of apes makes their torso project out in front of the hips. This means that apes must use their arms and hands to support their weight. This is why apes are sometimes referred to as 'knuckle-walkers'.

(8) UPRIGHT SKULL

The position at which the spinal cord enters the skull is called the 'foramen magnum'. In the case of humans, the foramen magnum is located at the bottom of the skull. This means that the most natural position for the human head is looking forward in the upright position. If humans attempt to walk on all four limbs, the head has to be forced up in order to look ahead. When babies crawl on four limbs, it can be observed that they have to lift their head up to look ahead. In contrast to humans, apes have a foramen magnum located at the back of the skull so that the most natural position for the head is looking forward in the horizontal position. Even though an ape can look forward when sitting upright, this is only possible when the head is bent downwards.

(9) FLAT FACE

Humans have a uniquely flat face that gives them a large field-of-view (taking into account eye movement). The flat face of humans means that when they are in an upright position and looking straight ahead, they can turn their eyes downwards and look down at the ground in front of their feet. In contrast, apes have a large protruding chin and their field-of-view is much more restricted. The ability to see the ground just in front of the feet is very important for humans because of their high position above the ground and their two-legged movement. When a human loses footing whilst walking or running, it can be very difficult to regain balance because the centre of gravity of the body must be kept above two feet. In contrast, it is relatively easy for apes to regain balance because they are closer to the ground and have four points of contact with the ground.

(10) FINE BALANCE

Standing and moving on two legs requires a much finer sense of balance than moving on four legs. In order to balance on four legs, it is only necessary to keep the centre of gravity of the body within the four points of contact on the ground, which is quite a large area. However, when standing on two legs it is necessary to keep the centre of gravity exactly between the two feet and this represents a relatively very small area. Another reason why it is relatively difficult to balance on two legs is that the centre of gravity is higher above the ground compared to a four-legged posture.

> "The upright stature of humans gives them a graceful mobility that is superior to every other animal in creation."

Humans and apes achieve balance mainly through sensors in the inner ear. The inner ear has three semicircular fluid-filled canals that are sensitive to movement and gravity. The canals are arranged in three planes that are at right angles to each other and this gives three-dimensional sensing.

Humans have a relatively small semicircular canal in the horizontal plane and two large semi-circular canals in the vertical plane (anterior and posterior). This shows that humans have balance sensors specifically designed for walking upright. In contrast, apes have three relatively small semicircular canals and each is a similar size. The similar size of the semicircular canals in apes shows that apes are designed for climbing in three dimensions (arboreal movement). It is also important to note that there is no evidence of transitional semi-circular canals in the fossil record (Spoor *et al.*, 1994).

Unique abilities

The upright stature of humans gives them a graceful mobility that is superior to every other animal in creation.

(1) TWO-LEGGED STANDING

Two-legged standing is very easy for humans because the knee joints lock in an upright position. In contrast, apes need to have bent knees when they stand up and they need to strain their muscles constantly. Whereas a human can easily stand for hours at a time, apes get tired of standing after just a few minutes. The ability to stand with ease is very important in many work and leisure activities. Human life would be very different if it were not possible to stand easily for long periods. It is difficult for evolutionary theory to explain the perfectly upright design of the knees because comfortable standing does not give a significant survival advantage. However, the ability to stand comfortably is just what would be expected from a Creator.

(2) TWO-LEGGED MOBILITY

Humans have the unique ability to move on two legs with great agility. One of the key requirements for agile upright movement is the ability to stand on the front of the feet by balancing on the balls and toes of the feet. This is why sports coaches sometimes encourage their athletes to stay 'on their toes'. When balancing on the ball and toes of the feet, it is possible to move quickly in different directions. As well as being able to stand on the front of the feet, humans have an amazing sense of upright balance. The supreme ability of humans to move on two legs is demonstrated in many different sports. Top sports people can run, twist and turn with breathtaking speed and precision. It is not only sports people who are capable of amazing upright balance. Everyday activities like walking up and down stairs, gardening and housework often involve fine balance on two legs. In contrast to the potential of the human body, apes have no ability to move on two legs with agility. Apes cannot stand on their toes nor maintain two-legged balance.

Not only do humans have very good mobility but they also have amazing co-ordination between the hand and the eye during movement as shown by sports like tennis and squash. The unique bipedal ability of humans is clearly seen in the development of human babies. At the age of about one year, human babies have an urge to walk on two legs even though walking is much more difficult than crawling. In contrast, a baby ape has no desire and no ability to walk on two legs. Of course, evolutionists will argue that upright mobility evolved in order to make humans better hunters and escapers. However, as already described, the human being has an irreducible design of upright stature that cannot evolve step by step. And even if the problem of irreducible complexity could be answered, it is hard to explain why humans are so perfectly designed for two-legged upright mobility.

(3) ALL-ROUND PERFORMANCE

Man has a unique all-round performance when it comes to mobility. Three of the most important aspects of mobility are the ability to walk long distances, the ability to carry whilst walking and the ability to climb. Man is the only creature that has all three of these abilities. Whilst apes can climb, they cannot carry significant loads whilst walking and they cannot walk for long distances. Whilst horses can travel long distances, they cannot carry objects (without human intervention) and they cannot climb. There are many creatures that can move with impressive speed or agility in nature. However, there is no creature that has the all-round ability of humans.

ATTEMPTS TO TRAIN APES TO MIMIC HUMAN MOVEMENT

There have been attempts to train apes to perform some of the two-legged movements of humans. However, these have always served to prove that apes are incapable of matching human upright movement. In recent years a film has been produced called Most Vertical Primate in which an ape supposedly becomes a competent skateboarder. However, even though a very well-trained chimpanzee was chosen for the part, it was incapable of performing even the most basic skateboarding manoeuvres. It was found that the ape could not stay on the skateboard for more than a few seconds without falling off. As a result of the very limited ability of the chimpanzee, the producers had to use some ingenious methods for giving the impression that the ape could skateboard.

Evolutionists have argued that differences between living apes and humans do not constitute a problem because they come from a common ancestor. However, the hypothetical common ancestor would still have to be a quadruped ape-like creature, so the arguments in this paper are still valid. A leading evolutionary palaeontologist, G.G. Simpson has admitted that the theory of evolution must involve humans evolving from an ape-like quadruped creature (Simpson, 1960).

Unique purpose

Part of God's plan for man is that man should have dominion over all the creatures of the earth (Genesis 1:28 and Psalm 8:5–8). Therefore it is not surprising that God has given man a stature that makes it very easy for him to have dominion over the earth. Being bipedal means that man's arms are free to control other creatures and other creatures cannot stand up to man and challenge him. If another creature like an ape had an upright stature then it would not be so clear that man was the steward of the earth.

The upright stature of man also has the purpose of enabling him to enjoy physical activities like walking, running and sports. The upright stature of man also encourages him to look up into the heavens to see the glorious splendour of the stars and to consider the reality of heaven. Matthew Henry says the following about the stature of human beings:

> "Man has this advantage above the beasts, in the structure of his body that whereas they are made to look downwards, as their spirits must go, he is made erect, to look upwards, because upwards his spirit must shortly go and his thoughts should now rise" (Henry, 1710).

Last summer many people applauded outstanding feats of sport and skill at the London Olympics. Those feats provide compelling evidence for a Creator and compelling evidence that humans are unique and special creatures. ■

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The Genre and Goals of Genesis 1–11

Part 1

James E. Patrick

Sumerian King List Prism.
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Summary

Knowing the genre of a text is essential for understanding what it is trying to say. The first of these two articles therefore looks at the genre of Genesis 1-11, comparing it with similar writings from the ancient Near East and with later Israelite interpretations contained in the Bible. On this basis, it is clear that Genesis 1-11 was intended to be seen as entirely historical, and relevant for scientific investigations. Biblical cosmology may be strange to modern minds, but that does not make it untrue. Similarly, the Bible's claims about the age of the earth would have been controversial and offensive even in the time Genesis was written, so we need not try to apologise for them today. The second article then focuses on the theological goals of Genesis 1-11, looking at the purpose behind the chronology, the genealogies, the seven days of creation, and the theme of consecrated land. It turns out that the real message of Genesis 2-3 can only be understood properly in connection with the six days of creation in Genesis 1.

The Genre and Goals of Genesis 1-11

Part 1

On Halloween 1938, CBS radio listeners in America were disturbed to hear a series of apparent news bulletins about a current invasion of earth by aliens. Although the programme was written as a dramatic adaptation of the science fiction novel *The War of the Worlds,* the many who failed to recognise this fictional genre interpreted it instead as literal truth, and some even fled their homes in panic. Most would consider such a response to be entirely reasonable, despite the obvious unreality of aliens, because of the programme's impression of authority and also its audience's anxiety in the years leading up to World War 2.

Today, many people view literal interpretations of Genesis in a similar light – understandable but sadly misguided, and probably a reaction to various sociological issues in America's Bible Belt. Scientists are thought to be unanimous in their conviction that the world was not made 6000 years ago and it was never destroyed by a global Flood. That means that the plain sense of Genesis 1-11 must be incorrect, so non-Christians quickly dismiss its author's beliefs as primitive and a product of his environment.

Christians, though, believe the whole Bible to contain the revelation of God to humanity, and are therefore forced to show some respect to its ancient authors also. Many Christian scholars want to help their literalist brothers and sisters return to 'reality', and their solution has been to try to demonstrate that Genesis 1-11 was in fact never meant to be taken literally. It may even have been just an adaptation of mythical creation stories known in neighbouring cultures. If these passages belong to a genre other than 'science' or 'history', then it might be possible to appreciate their 'truth' on a deeper spiritual level without having to contradict mainstream scientific views.

On the other hand, if the literalists are actually correct to categorise the genre of these texts as factual record of history, then the original author's beliefs about this historical period are supported by the weight of divine authority, according to the Christian doctrine of the inspiration of Scripture. The effect would be as shocking as someone were to discover that the news bulletins of the 1938 radio drama were actually true, decisively contradicting all scientific scepticism about the existence of aliens. Even though the events recorded in Genesis 1-11 are said to have happened up to six millennia ago, their factuality would make the possibility of global catastrophe as divine judgement suddenly much more relevant to the modern world, as the apostle Peter pointed out in 2 Peter 3:3-7.

It is crucial, therefore, that we come to an agreement about the original genre of Genesis 1-11, because the genre defines what sort of 'truth' the author meant to communicate to his audience. To address the question adequately will require two articles, this first one considering questions of genre, whether that be poetry, science, cosmology, or history, and the second article considering questions of goals – the purpose of the author in terms of chronology, legal inheritance claims, and theological instruction, in the context of the rest of Genesis. It may be worth noting that in these articles the 'author' is understood to be the one who finally drew all together all earlier traditions or texts handed down to him, and composed the book of Genesis to be a single coherent work.

Genesis 1 as poetry?

Various genres have been proposed for different parts of this passage, but to begin, it must be made very clear that Genesis 1 is certainly not 'poetry'. All scholars accept that Hebrew poetry is identified by its use of poetic parallelism, as found in 2:23, 4:23-24 or 9:6-7. That is not to deny that Genesis 1 is structured prose, the first three days clearly paralleling the second three days, but such patterns can actually be found in history just as they are in the natural world. For example, the twelve sons of Jacob in 29:31-30:24 (30:24 looking forward to 35:16-18) were apparently born in a neatly balanced pattern: four sons of Leah, four sons of Rachel and Leah's maidservants, two sons of Leah and then two sons of Rachel.

Furthermore, in other historical passages a week may be divided into two three-day periods followed by a climactic seventh day, without turning it into poetic fiction. For example, Egypt's decisive last week of plagues had three days of being warned about hail and locusts, three days of darkness without warning, and then the death of the firstborn on Passover (Exodus 9:13-11:8). The same week at the other end of the forty years of wandering had three days of consecration before crossing the Jordan, three days after the crossing and circumcision at Gilgal (cf. Genesis 34:25), and then the Passover (Joshua 3:1-5:12; cf. Exodus 12:43-49). David's own final week of wandering before succeeding Saul as king had three days journey up to Aphek, three days returning to Ziklag, and then victory over the Amalekites (1 Samuel 28:12; 29:1-30:17). Whether logical or symbolic, a week thus divided is no less historical.

The origins of science

It is often declared 'self-evident' that Genesis 1 should not be treated as 'science', in the modern sense of the word. Of course it is not naturalistic science in the sense of denying supernatural causes, which would be rare indeed in the ancient world. However, the wisdom enterprise in ancient Israel certainly did include the discipline of science, if by 'science' we mean careful observation and classification of the natural world in a way that is comprehensible to all, regardless of religious affiliation. The wise king Solomon is said to have studied every variety of flora and fauna found in Israel and probably beyond (4:33-34), and in the wisdom text of Job, the Lord gives Job an extended lesson in natural history in order to remind him of the limits of his knowledge (Job 38-41). The book of Ecclesiastes, also attributed to Solomon, is a clear example of drawing (philosophical) conclusions based on repeated experiment and observation.

> "It is crucial, therefore, that we come to an agreement about the original genre of Genesis 1-11."

Psalm 104 is also a 'scientific' reflection on natural phenomena observed in the psalmist's own day, for the purpose of glorifying the Creator. For example, as in Genesis 1:21, the psalmist describes in entirely natural terms the sea monster which others of his day typically associated with malevolent mythical or supernatural forces (Psalm 104:26; cf. Psalm 74:13-14; Isaiah 27:1). Interestingly, this psalmist has clearly been inspired by Genesis 1-3, deciding to arrange his own observations of nature according to the seven-day pattern of its creation. We have here probably the earliest interpretation of the first chapters of Genesis, showing us how they were probably understood by their first audience.

Psalm 104 as commentary on Genesis 1-3

Psalm 104:1-2a covers Day One, on which light was created, and the psalmist clearly reasoned that if light-giving heavenly bodies were only created on Day Four, the light on Day One must be independent of them, and therefore have a divine origin. 104:2b-4 explores Day Two, noting that if God's palace in 'heaven' was made on this day, His angelic servants must also have been created at the same time (for a similar concept see Genesis 2:5-8). Even so, deliberately ambiguous language is used so that he can be interpreted as speaking only of the natural phenomena of winds and lightning. From Day Three, the separation of land from water and especially the creation of vegetation is the theme of the lengthy section 104:5-18, which also echoes the 're-creation' of land after the Flood. Day Four with its appointment of sun and moon to govern day and night is contextualised in the psalmist's own experience of going to work and avoiding lions in 104:19-23.

Psalm 104:24-26 refers only to the fish created on Day Five; birds were mentioned earlier in the section on Day Three because of their reliance on vegetation. This was not a mistake, though, but a way of dealing with an apparent contradiction: Genesis 1:20-23 has birds created alongside fish on Day Five, but Genesis 2:19 records their creation alongside land animals instead, which must be Day Six. Even so, 104:27-30 which describes Day Six is probably an attempt to resolve this inconsistency. It makes the interesting observation that although birds were created on Day Five, they had to 'wait' to be 'given food in its appointed time' on Day Six alongside the rest of the land animals (Genesis 1:30), which would presumably mark the completion of their creation. The mention of 'returning to dust' clearly echoes Genesis 3:19, showing that both animals and mankind are in view in this section.

Finally, Day Seven is depicted in 104:31-35, bookended by the parallel statements "let the Lord be glad in His works" and "I shall be glad in the Lord". This is an ideal summary of the purpose of the Sabbath day, when the Lord came down to walk in the Garden with mankind (Genesis 3:8-9). The time when He 'came down' again on Mount Sinai may be hinted at in the description of earthquakes and volcanoes (104:32; Exodus 19:18), and perhaps the expulsion of Adam and Eve is reflected in 104:35.

It seems fairly clear, therefore, that the author of Psalm 104 was treating Genesis 1-3 as a coherent narrative, putting some thought into apparent inconsistencies such as the presence of light before luminaries, or creation of birds on two different days. This 'literal' understanding of the sequence of the days of creation went hand in hand with a more 'scientific' approach, observing and classifying natural phenomena he saw around him according to their created order, in light of both creation and flood stories found in Genesis.

Ancient Israelite cosmology

Even if we grant that Genesis 1-3 was understood to be of 'scientific' value by the ancient Israelite psalmist and his audience, some might then ask whether it is reasonable for educated 21st century thinkers to accept as authoritative the 'primitive', 'unenlightened' conception of the world that those ancient Israelites would have had? Some suggest, for example, that Israelites conceived of the world as a simplistic flat earth covered by a firm dome of the sky, and sitting on foundations to stabilise it, above a shadowy earthen underworld. These ideas do find echoes in poetic texts at times, but biblical texts are far more nuanced than this. For a thorough and fair analysis of all these texts in their ancient Near Eastern context, the reader is recommended the book by Stadelmann (1970).

Earth and sky

The idea of a naïve belief in a 'flat earth' by the ancients has been exposed as a recently invented urban myth by Russell (1991). Evidence pointing the other direction would have come from the science of astronomy, found in nearly every ancient civilisation, which could easily perceive the roundness and periodic cycles of heavenly bodies (cf. Judges 5:20; Job 38:32; Isaiah 40:26). It would not be too big a step to suggest, as did the ancient Greeks, that the earth also is round, particularly considering the circular nature of the horizon (Job 26:10; Proverbs 8:27). Job 26:5-11 describes the earth not on pillars (e.g. 1 Samuel 2:8) but hung over nothing, and it recognises that the moon is some way beyond the clouds.

Just as the common biblical description of 'four corners' of the earth or heavens (e.g. Jeremiah 49:36) does not in any way imply that Israelites understood either entity as square, so we must give them credit for being able to distinguish figures of speech from reality. Another figure of speech is the picture of the sky as a bronze dome (Job 37:18; possibly Amos 9:6), but this was most likely just an evocative visual metaphor for a cloudless sky (Leviticus 26:19; Deuteronomy 11:17; 28:23; 1 Kings 8:35; Malachi 3:10; Genesis 7:11; 8:2). In fact, the sky can be pictured alternatively as a curtain or a tent (Psalm 104:2; Isaiah 40:22), metaphors better suited to speaking about heaven as God's throne room (cf. also Psalm 19:4-6).

> "Just as the common biblical description of 'four corners' of the earth does not in any way imply that Israelites understood either entity as square, we must give them credit for being able to distinguish figures of speech from reality."

Heaven and Hades

Be that as it may, it is important to recognise that ancient Israelites did indeed understand God's dwelling place to be located physically high above the earth. The unusual proximity of God's heavenly house to earth in Jacob's dream at Bethel (Genesis 28:12-17) does not contradict its normal situation at a vast distance beyond the stars (Job 22:12-14; Psalm 57:5, 11; 113:4-6). This would be consistent with the ascension of Elijah (and later Jesus also) upwards into heaven. Before we dismiss this as merely figurative, if one believes God's heavenly throne room was designed and created by Him just as was the earth (cf. Psalm 104:2-4), it would make sense for Him to locate it in some unspecified spatial relation to the earth's surface, just as human bodies and spirits are somehow connected. All of God's creation, physical and spiritual, must be subject to the same divine laws.

On the other hand, the underworld and place of departed human souls is clearly understood to be literally beneath the earth's surface, and although Numbers 16:30-34 describes it coming scarily close to the surface, its more usual position would be far further beneath. Job's description of mining activity (Job 28:1-22) shows no fear of interfering with the underworld, and Jonah 2 sees Sheol as located roughly as deep as the roots of the mountains. Again, who is to say that ungodly human souls do not 'descend' spatially to a dark waiting place or 'abyss' beneath the earth's surface?

The science of the spiritual

Biblical authors had no philosophical assumption of naturalism, freeing them to explore the interrelation between the physical and the spiritual in ways rarely if ever attempted by modern scientists (cf. Proverbs 3:7-8; 14:30; 15:30; 16:24; 17:22). For example, while moderns tend to view 'thinking' as purely the responsibility of the brain, we would be foolish to deny the involvement of other parts of the body in the process, such as the 'gut-wrenching' effect of bad news or the 'heart-warming' reaction to the opposite.

It is undoubtedly true that knowledge of ourselves and our terrestrial and galactic environment has progressed far beyond what was possible for ancient scholars. However, partial understanding is not necessarily false understanding, and modern science that ignores the spiritual dimension is far more 'ignorant' than ancient (biblical) science that knew little but knew it truly.

The historical nature of 'myths'

An ancient audience of Genesis 1-11 would have seen Genesis 1 as a 'wisdom' text scientifically categorising the natural world, and at the same time would have recognised within it many features of the well-known creation and Flood stories contained in origin myths of surrounding ancient Near Eastern cultures, particularly Mesopotamia and Egypt (see discussions of similarities and differences in Wenham, 1987; Heidel, 1951; Clifford, 1994). However, what would stand out immediately to them would be the remarkably precise narrative framework of the whole account.

The Bible's connection of creation and Flood with recent history was certainly not unique in ancient literature – the Sumerian King List from the third millennium BC similarly noted that the vastly long reigns of earth's first rulers were separated from the shorter reigns of more recent rulers by a Flood which 'swept over'. The legendary and yet probably historical king Gilgamesh is one of the latter kings listed, and the standard version of his Epic, written much later, describes his journey to meet an ancient Noah-figure who had survived the Flood with his family and had been granted immortality for his piety. We cannot simply assume, therefore, that ancient Mesopotamians would have seen their creation and flood myths as 'non-historical', despite their obvious ongoing symbolic significance for religious practices.

Genealogies and dates

The difference with Genesis, though, is not just the more 'realistic' ages of pre- and post-Flood rulers compared to the Sumerian King List, but also their interlocking chronological connections with each other, forming an entirely inflexible sequence of fathers and sons from Adam down as far as Jacob's entrance into Egypt. Genealogies as a general rule did not include any dates at all, and could therefore skip multiple generations between the more important ancestors (cf. 1 Chronicles 1; Ruth 4:18-22; Ezra 7:1-5). Remembering dates was usually connected instead with asserting legal claims (e.g. Genesis 31:36-55; Judges 11:12-28; 2 Samuel 5:1-5; Ezra 4:24-6:15).

The precise dates given for the various stages of the Flood in Genesis 7-8 are entirely without parallel in ancient Near Eastern accounts of the Flood.[1] Although none of the dates correspond to later Israelite festivals, they might best be explained as enabling people in ancient times to commemorate this decisive deliverance in human history, just as the Passover was remembered annually on the same date by Jews from the Exodus onwards. The ancestral and geographical distribution of the seventy nations in Genesis 10 would also have been understood to be an ancient historical record of commonly recognised family connections between all people groups on earth known to the author (see Kitchen, 2003).

The scandal of youth

It is worth noting that the author of Genesis cannot have been unaware of the controversy his dating of the creation and Flood would cause among his contemporaries. Egyptian and Mesopotamian historians from the earliest times were always concerned to represent their own respective civilisations as the oldest and most consistently politically unified kingdoms in the world. Modern calculations of the start of the Bronze Age are still dependent on their 'historical' records, even though it is quite apparent to experts that they were prone to vast exaggerations of antiquity. The biblical record, on the other hand, puts the Flood a mere thousand years before the Exodus, and makes a mockery of the proud assertions of all other ancient empires (as much as it does of modern calculations of the dawn of human civilisation).

This is entirely consistent with the Bible's similarly scandalous interest in highlighting the faults of every heroic ancestor of the Israelite people. For example, the author of Genesis is not ashamed to point out that Israel will be the last nation to get kings, later even than Israel's brother Edom (36:31; cf. 35:11). Israel itself is not mentioned at all in Genesis 1-11, nor is their territory or capital city glorified at its conclusion, as one would expect of any other creation story in the Ancient Near East. Entirely lacking in self-serving interest, Israel's historical account of mankind's origins appears to be the most inclusive, objective and sober-minded of any ancient civilisation.

Conclusion

Knowing the genre of a text is essential to interpret its meaning properly. For Genesis 1-11, the best way of identifying its genre is to compare it with other similar ancient Near Eastern texts, and to observe how it was interpreted in later Israelite literature such as Psalm 104. These comparisons show that the author's original audience would have recognised his writing to be important for scientific study as well as for historical knowledge of earliest humanity and the Flood, despite its bold contradiction of the claims of contemporary empires. Of course, scientific and historical writing may also be theological, so the next article will consider the goals of Genesis 1-11. ■

Footnotes

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[1] The third century BC Babylonian historian Berossus records that the Flood began on the fifteenth day of the second month, rather than the seventeenth day in the biblical account, and the Atrahasis and Gilgamesh epics say that the Flood lasted only seven days, but Genesis alone gives absolute dates for each stage of the Flood.

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Kinesin – another of God's remarkable designs!

J H John Peet

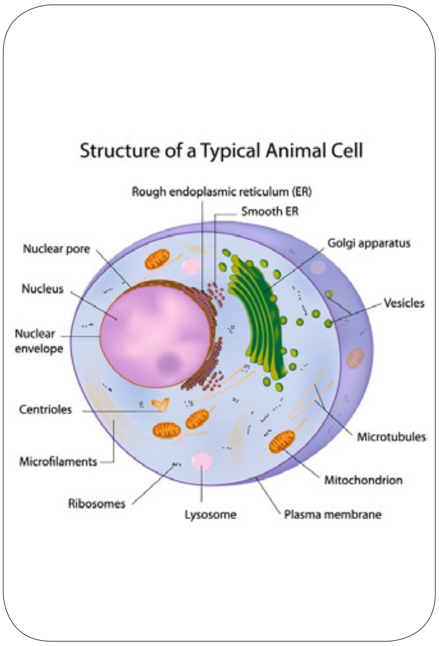


Diagram of animal cell structure.
© Alila, www.fotosearch.com

Part of an oil refinery, Rotterdam, Netherlands.
© Olivier Lantzendörffer, www.istockphoto.com

Anyone who has studied the biological cell – even superficially – will have been amazed at what they find. A "simple" picture is to consider it to be a microscopic form of a large industrial chemical factory.

We can find analogies to the different functions of the cell components by comparison with a modern industrial plant. In recent years the detail has become clearer in many aspects of the cell life and processes. For example, we might wonder if there is an equivalent to the transport system in a chemical plant. Are there "roads"? Are there "vehicles" to carry raw materials and products from one site to another?

The answer to these questions is in the positive. The roads are replicated in the microtubules. They have a diameter of 25 nm and vary in length between 200 nm and 25 micrometers. Microtubules consist of a helical arrangement of proteins called *tubulin.* The tubulins are arranged as 13 parallel protofilaments.

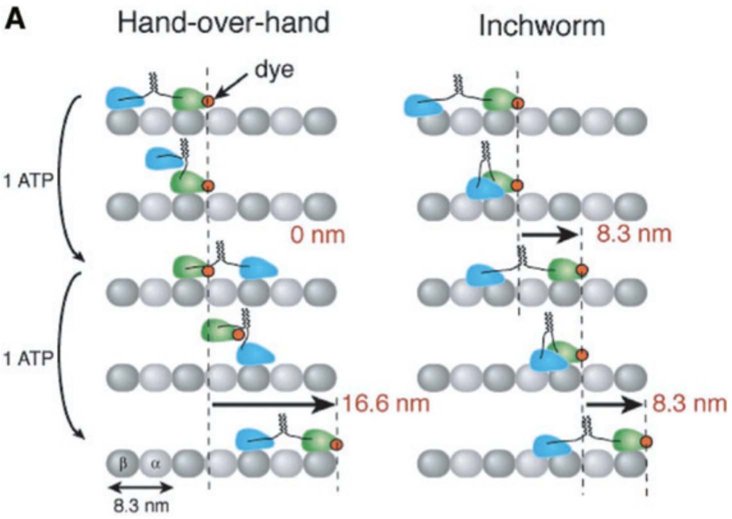
Microtubules are important for vesicular transport, moving, for example, lysosomes and endoplasmic reticulum. (Small molecules move rapidly enough by diffusion, but large molecules and larger structures would move far too slowly by diffusion and need motorised transport). They are relatively large objects (compared to the small molecules that "feed" the cell) and so need powerful, controlled, automated transport. One may compare the procedure to the internal transport systems running between airport terminals (*e.g.* at Gatwick) or stations on the Dockland Light Railway.

The vehicles for the movement of biological structures belong to the chemical family of *kinesin.* There are a variety of these motors and we shall concentrate on one as an example, *kinesin-1.* They are found in both animal and plant cells.

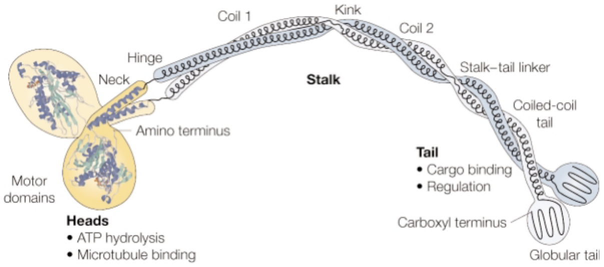
As shown in the figure, the structure is dimeric, that is, it consists of two intertwined chains, each with a "head" and a "tail". The head and "neck" regions have specific sites that enable them to bind to the microtubule and for ATPase to bind to the kinesin. (The ATPase is the energy producing unit). Human cells have a range of about 40 types of kinesin so as to enable them to link to different objects. (Böhm, 2004).

The microtubules have an electrical polarity (a positive and a negative one) and so they act like an electrical rail. The molecular motors generally move in one direction only. Kinesin moves in the positive direction. A related system, *dynein,* moves in the opposite direction. For kinesin, this means a movement from the centre of the cell to its periphery. It seems that the two types of motor work in conjunction.

A typical rate of movement of a kinesin motor would be 0.4-0.9 µm per second, but rates can vary significantly. This may seem slow, but on a cellular scale, it is very significant. It is equivalent to the molecule taking 125,000 steps per mm. The rate can be increased by raised temperature or by the presence of



Examples of two alternative ways the kinesin molecule could move, the hand-over-hand model (left) and the inchworm mechanism (right).
© American Association for the Advancement of Science.
Used with permission Yildiz, Tomishige, Vale and Selvin, P.R. (2004)



Structure of kinesin molecule.
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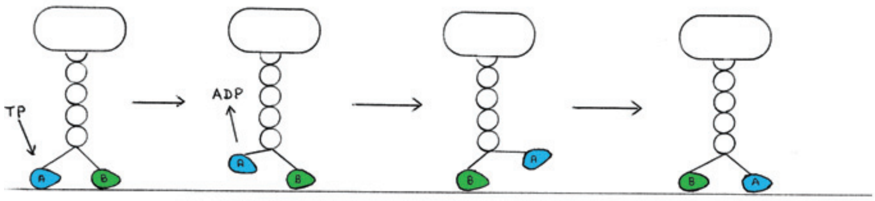

Thumbnail sketch of hand-over-hand kinesin movement.
© J H John Peet

magnesium ions (Mg^{2+}). But, how does it move?

Remarkably, it has the hallmarks of bipedal walking! (Asbury, 2006). There are good video clips available on the internet demonstrating this motion (*e.g.* Milligan Lab., 2000). In order to move, the kinesin has to convert chemical energy (supplied by ATPase) to mechanical energy.

As the kinesin steps along, one head must be in contact with the microtubule, just as when we walk along one foot must be in contact with the ground. It seems that the ATP bound to the head/neck core undergoes hydrolysis to ADP in order to release the energy to power the movement of the head forward.

Any moving object needs to be able to stop as well as go! Tatsu *et al.* (2006) discovered that this is achieved by the action of light. Peptides (small sections of proteins) are generated from the kinesin and when light strikes these, they become activated and adhere to the microtubule preventing further motion. Of course, this leaves questions as to how the process can be triggered in the living cell.

Conclusion

There are still a number of issues that need clarifying including the basis of identifying the load by each kinesin structure, its loading mechanism, the synthesis of the kinesin itself and so on. But each of these areas of research underline the marvel of the structure and role of this substance. We believe that it shouts "Design!" and points to God as the Intelligent Designer. If we believe the Bible, then we must expect to see evidence of design and so we are not surprised to find it. Evolutionists deny a Designer, but they cannot prove their claim and are frustrated by the apparent evidence of design! It is a statement of faith on their part that there is no Designer. ■

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In the Beginning

John Allen

Ravi Zacharias International Ministries provide resources for Christians, especially in the area of apologetics, in many countries. The European branch is based in Oxford and amongst the resources produced is an annual 'Training Day' in Oxford on the last weekend of January, and I have been to several of these with considerable profit. This year the theme was 'In the Beginning'. The faculty (John Lennox, Michael Ramsden, Amy Orr-Ewing, Vince Vitale and Tom Price) were all, I thought, theistic evolutionists, and asking around supported that assumption. I was unsure whether to attend or not, as I did not want pay out to find myself in a meeting where creationist views would be rubbished without a chance of reply.

In the end I decided to attend. The afternoon featured an excellent survey of academic philosophy by Vince Vitale, a tour-de-force which was worth attending for on its own, and a novel session by Tom Price looking at a couple of commercial films and our possible responses to them and the issues they raised.

However, it was the two sessions in the morning by John Lennox which justified the title 'In the Beginning', and the following are the main points I garnered from the sessions.

To begin with, from a series of off-the-cuff comments during the sessions, it seemed to me that Prof Lennox's views were strongly influenced by two issues:

Firstly, the tendency amongst some young earth creationist (YEC) elements, primarily in North America, to argue that, if you are not a YEC, then you are not, or probably not, a Christian at all.

Secondly, that he has come across those who refuse to seriously consider Christianity because there are such people as YECs, and that, if creationists would only be quiet, then these people could be guided to a serious consideration of the claims of Christianity.

I would summarise the points Prof Lennox made during the sessions as follows:

1. He acknowledged throughout the incontrovertible fact that godly thinkers have different convictions regarding the first chapters of Genesis, a situation explicable by all of them having variations and weaknesses. I doubt this is a new issue. In my translation of Eusebius' 'The History of the Church ', he records a number of bishops in the 2nd Century who wrote books with titles like 'The Six days of Creation' and 'The Six days' and others of like subject.
2. There is general agreement amongst Christians of the fact of Creation if not of the timing; as Romans 1v 19 makes clear, the universe gives us real and useful information about God – that he is the creator, and what sort of creator he is.
3. Hermeneutics reared its ugly head with an in-depth discussion of how to understand the various levels of meaning in Scripture, as words and phrases can have more than one meaning, e.g., earth can mean the planet or dry land or even dust and mud. When Jesus said he was the door, he did not mean a wooden door, although he did mean a real door – the metaphor does not weaken the expression because Christ is a real door. When in Genesis 1 it says "God said" it does not require God to have a

Christliches Medienmagazin Pro John Lennox.

voice-box. The problem remains the subjective nature of the judgements of interpretation that necessarily have to be made.

4. Prof Lennox drew attention to historical changes in the subjects of debate. 500 years earlier in Oxford, the argument would probably have been about whether the earth moved, as postulated by Galileo, or was fixed, as inferred from Psalm 104v5. He did make the point, though, that the fixity of the earth was not derived from Scripture, where the language is often phenomenological, but from Aristotle, who had said "the earth does not move". It is possible, of course, that scientists maintain billions of years, not because the Bible speaks of "everlasting hills", but because Lyell and Hutton said so.

5. There was a closer look at the first chapters of Genesis, which provided some interesting points. The point was made that 'day' can mean 24 hours, and era, or simply stand for 'when' (the day of the Lord). These are all normal uses of the word, making interpretation complex. The point was made that the Hebrew has 'a' day for Days 1-5, but 'the' day for days 6 and 7, with possible implications for interpretation.

6. Prof Lennox declined to discuss evolution on the perfectly reasonable grounds that he had written a book about that subject. He did make the point that Gen 1 emphasises that mankind was God's special creation and made differently and separately to the animals, going for an old-earth/young mankind position, with the rest of the creation developing according to the Darwinian paradigm, but mankind being specially and distinctly created in the recent past.

7. Gen 1 is Christianity's founding assertion, as all credible philosophies and world-views require an explanation of origins. He also argued for a number of ID assertions.

8. Questions were interesting as well. In response to a question concerning the Flood, Prof Lennox argued for a number of singularities in Earth history found in Scripture:- including Creation, the creation of man, the Fall, the Flood, the Incarnation and the resurrection, arguing that these are not, as singularities, open to scientific study.

Overall, it was a useful event. What was interesting was his reluctance to dismiss YEC, presumably as his whole thrust was that a number of positions were permissible with Scripture, and this includes the Young Earth position. As it would seem he took the approach that particular positions were possible and none were compulsory, he could not rule other positions out.

Clearly, I think we would have to agree that the YEC position is not a criterion for being or not being a Christian, and I would have sympathy with his criticism there.

Christian love and common courtesy are necessary when discussing these controversies with others – including other believers. However, I would think anyone who declined to consider Christianity because it conflicted with long ages and Darwinian evolution is also very likely to decline to consider it because it involves the resurrection of the dead – see Paul at Athens.

I had thought it possible that it might end up as a 'YEC is completely unacceptable' attack; this was not the case, either out of courtesy or because the good Professor was aware that YEC is moving more mainstream in evangelical circles and did not wish to antagonise at least part of his audience unnecessarily. What was interesting was the willingness to accept the recent creation of man, although how that was compatible with the Biblical view of the corruption of the world after the Fall described in Romans 8 I do not know.

I recently watched 'The God Delusion Debate' between Prof Dawkins and Prof Lennox with my wife, whose comment at the end (regarding Prof Dawkins) was 'Is that the best they've got?'. From this meeting it would seem that theistic evolutionary arguments are not much stronger. ■

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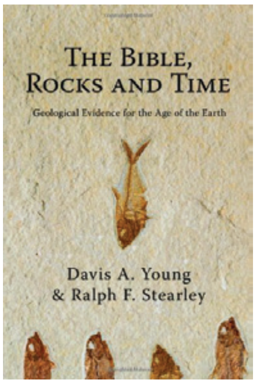
Book Review
The Bible, Rocks and Time
Geological Evidence for the Age of the Earth

Davis A Young and Ralph F Stearley
IVP Academic, Downers Grove, Illinois, 2008. 510 pp.
ISBN 978-0-8308-2876-0 **£19.99**

Reviewed by Sylvia Baker


The Bible, Rocks and Time
Geological Evidence for the Age of the Earth
Davis A. Young
& Ralph F. Stearley

Davis Young and Ralph Stearley are on a mission to convince us that the Earth is old and they do not mince their words; on page 22 they tell us that to believe that the Earth is young is "to dwell in appalling gross darkness". After this unpromising start, I rather dreaded reading the rest of the book. However, I need not have worried. Young and Stearley begin by describing in fascinating detail the prevailing view of the Christian church regarding the age of the Earth throughout the centuries, together with a description of the historical rise of geology as a discipline. These considerations occupy nearly 200 pages and left me more convinced than ever that the Earth is young. The picture which emerges clearly is that the Church almost universally believed that the Bible teaches a young Earth until deism and Enlightenment thought took over in the 18th Century. Modern geology was born out of young-earth creationism with its emphasis on a global catastrophe and when this view was discarded it was not because of the evidence but because of a rejection of the authority of the Bible. The tragedy is that Young and Stearly do not seem to be able to see the implications of the history which they so ably describe: that it was change of world-view which caused the evidence to begin to be interpreted differently.

A further strength of the book concerns the attitude that Young and Stearley take to the recent resurgence of young-earth geology. Despite believing that young-earth geologists are dwelling in appalling darkness, they not only admit that they exist but engage with their work. In comparison with how creationists are usually treated by those who disagree with them, this almost amounts to a compliment. It also makes such work visible, especially when journal references are cited.

To critique the final 300 pages of this informative book would probably take at least another 300 pages. Here is where the authors present their "overwhelming" evidence for an old Earth, but even here but much space is taken up with attempts to refute the findings of the young-earth geologists. Overall, Young and Stearley have presented a wealth of detail and I hope that some young-earth geologists will return the compliment and respond with an equivalent tome. The outcome for me, once I had completed the 510 pages, was a renewed confidence in the power of the Biblical creationist world-view.

> "To critique the final 300 pages of this informative book would probably take at least another 300 pages. Here is where the authors present their "overwhelming" evidence for an old Earth…"

Three Books from John Lennox:

Gunning for God: Why the New Atheists are Missing the Target
Lion Hudson, Oxford, 2011. 248pp.
ISBN 978-0-7459-5322-9
£9.99

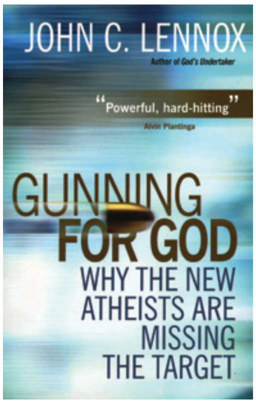
God and Stephen Hawking: Whose Design is it Anyway?
Lion Hudson, Oxford, 2010. 96pp.
ISBN 978-0-7459-5549-0
£4.99

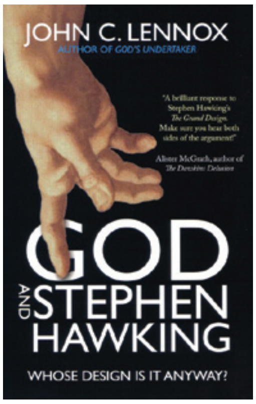
Seven Days that Divide the World: The Beginning according to Genesis and Science
Zondervan, Grand Rapids, Michigan, 2011. 188pp.
ISBN 978-0-3104-9217-7
£10.99 (Hardcover)

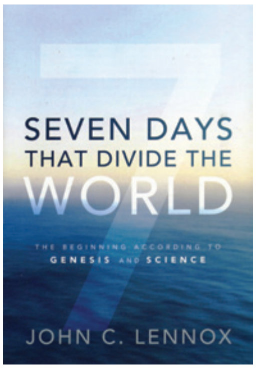
The writings and public debates of Oxford mathematician and philosopher of science John C Lennox have made a most welcome contribution to the origins controversy in recent years. Now we are treated to the publication of three books in quick succession. Each is characterised by Lennox's flair for clear expression and readability. The first two can be recommended almost without reservation, but that is not quite true of the third.

Gunning for God: why the new atheists are missing the target contains a brilliant, witty, exposé of the weakness, poor scholarship, fragility and general paucity of intellect that characterise the pronouncements of the new atheists. It is also a powerful and moving summary of the strength of the evidence for the reality and truth of the Christian message.

God and Stephen Hawking: whose design is it anyway? is a smaller,


JOHN C. LENNOX
Author of God's Undertaker
"Powerful, hard-hitting"
Alvin Plantinga
GUNNING FOR GOD
WHY THE NEW ATHEISTS ARE MISSING THE TARGET




SEVEN DAYS THAT DIVIDE THE WORLD
THE BEGINNING ACCORDING TO GENESIS AND SCIENCE
JOHN C. LENNOX

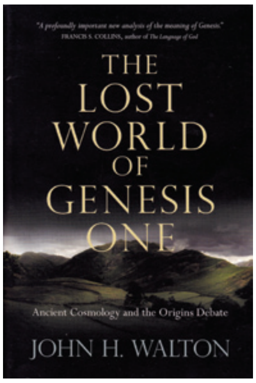
slimmer volume covering some of the same ground as *Gunning for God* but this time in the direct context of Stephen Hawking's anti-God book, "The Grand Design". Once again Lennox employs his sharp wit to provide a fascinating analysis of Hawkings' arguments, courteously revealing them actually to be ridiculous and illogical. There is one brief section where Lennox reveals his belief that the Earth is old and argues that this view is consistent with Genesis chapter 1. For me, this is the one flaw in an otherwise wholly recommendable volume.

In **Seven Days that Divide the World: the beginning according to Genesis and Science** Lennox's old-earth position comes right to the fore. The book is graciously written and a source of some interesting information on the topic, presented with Lennox's characteristic intelligence. Nevertheless, it saddened me. The early section contains references to Augustine and others that subtly give a wrong impression; Lennox could do with consulting Young and Stearley on the matter! A prevailing view in the early church was that the six days of Genesis were ordinary days but that they mapped on to six thousand years of Earth history. They got this view from the verse in 2 Peter (quoting Psalm 90:4) which says, in the context of the second coming, that one day with the Lord is as a thousand years. They therefore reckoned that Jesus would return after six thousand years of Earth history: two thousand years from Adam to Abraham; two thousand years from Abraham to Christ; two thousand years from the first coming of Jesus to his second coming. This rather intriguing version of events (given the current date!) reveals their approach to Scripture and to the age of the Earth. They had a well-thought-through position which was at great variance with the contemporary views of their time. Augustine specifically stated his view that the Earth was less than 6000 years old. He had problems with the creation story in Genesis Chapter 1 because he was giving ultimate authority to a verse in the Apocrypha which appeared to state that God made everything in an instant but this did not lead him in any way to think of the days as longer periods of time – quite the reverse. The current fashion for trying to make the early church allow room for an old Earth simply does not hold water and it is sad to see the admirable John Lennox going down this road. ■

Book Review
The Lost World of Genesis One
Ancient Cosmology and the Origins Debate

John H Walton (professor of Old Testament at Wheaton College)
IVP Academic, Downers Grove, Illinois, 2009. 192 pp.
ISBN 978-0-8308-3704-5 **£10.99**

Reviewed by Ray Trainer


"A profoundly important new analysis of the meaning of Genesis."
FRANCIS S. COLLINS, author of The Language of God
THE LOST WORLD OF GENESIS ONE
Ancient Cosmology and the Origins Debate
JOHN H. WALTON

Francis Collins, head of the Human Genome Project and author of *The Language of God,* commends this book by Professor John Walton by stating that it "presents a profoundly important new analysis of the meaning of Genesis." However, I consider that assessment an exaggeration. Yes, the book does bring together some interesting recent ideas into a coherent form and it also explains some other helpful insights of the author, but overall it is more of a curate's egg. It supports a theistic evolutionary approach to origins and, as such, it is an attempt to accommodate Darwinian evolution into a biblical framework.

Firstly, before we look at some of the issues and concerns this book raises, let me explain Professor Walton's thesis. The book is made up of 18 propositions which lead to three main conclusions. The first conclusion is that Genesis 1 *merely* describes *functional* creation and does not concern itself with material creation. In other words, within Genesis 1, God is using an already *pre-existing* cosmos in order to bring into the world purpose, order, and meaning. Professor Walton's second conclusion is that this purpose is specifically the inauguration of a *cosmic temple* for God's residence and rule. "This world is his headquarters" (p162). Of course these first two conclusions together–as they are a substantially different interpretation of Genesis 1 from young- and old- earth creationism, gap theory, and the framework hypothesis–comprise a new view of origins, viz. the *cosmic temple inauguration* view, to use Professor Walton's own words. The third and final conclusion Professor Walton arrives at is that this new understanding of origins clearly implies that Genesis 1 "offers no mechanism for material origins, and we may *safely* look to science to consider what it suggests for such mechanisms" (p163, emphasis mine). This in turn leads Professor Walton to embrace a theistic evolutionary viewpoint for the origin of life, albeit with some uncertainty over the details concerning the creation of "Adam and Eve".

Secondly, let me highlight some of the issues I have with this book. I accept that Professor Walton has a high view of Scripture. I also appreciate his heartwarming concern over the internal conflict many young Christians have when first they encounter some of the teaching of modern-day science. However, the answer to this conflict is not to gloss over the problems as simply non-existent or even to try to dodge them, but, rather, to face them head on.

First, Professor Walton places much stress on showing that Genesis 1 speaks of functional creation. I have no problem with this. Indeed I have always considered this to be self-evident. The problem I do have is that he considers Genesis 1 to be *only* speaking of functional creation. I think this dichotomy between functional and material is both unnecessary and unproved. I see no need for placing one against the other as if it has to be "either/or" rather than "both/and". In fact, a face-value reading of Genesis 1 requires both (e.g. Genesis 1:21f).

Second, even if Professor Walton is correct in his view that Genesis 1 speaks *only* of functional creation, then even this understanding of origins cannot sit comfortably alongside Darwinian evolution, for Darwinian evolution insists that there is no pre-determined design or purpose within the natural world. In fact, one of the primary arguments of Intelligent Design is that such functionality (or information) cannot be produced by mere random, undirected, natural processes over a long period time. Professor Walton's chapter on Intelligent design is the weakest in the book, showing his misconception of what Intelligent Design is all about!

Third, Professor Walton does not take into account the *genre* to which Genesis belongs. Genesis is an historical book in the same way that 1st Kings and Acts are. Yes, the aim of all these books is theological, but that does not remove the historical accuracy and reliability of what is written. Indeed, though the seven days of creation have clear symbolic meaning, so also, I think, do the seven years it took Solomon to build the temple in Jerusalem. Symbolism does not imply "mythology" with regard to 1st Kings; neither does it do so with regard to Genesis.

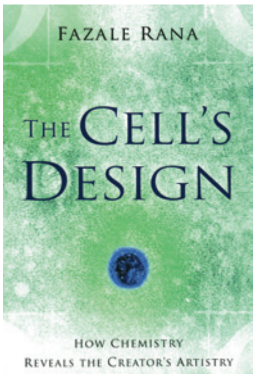
Fourth, though I fully agree that the Garden of Eden is a temple, I am not convinced that the entire cosmos is a temple. Professor Walton confuses the two and needs to do much more work on this in order to prove his case.

Fifth, Professor Walton misses the real point of conflict between theistic evolution and creationism, for it is not over our possibly-differing interpretations of Genesis 1 or the length of "day" within that same chapter (which Professor Walton concedes is 24 hours), but over such *theological* issues as the physical descent of all people from Adam (Romans 5:12-21, 1 Corinthians 15:21f, 45-49), suffering and death before the fall of humanity (Romans 8:19-23), the meaning of "creation was subjected to frustration" in Romans 8:20 (if, that is, the natural world is no different before and after the fall), and a global flood (1 Peter 3:3-10). Theistic evolutionists have yet to address these theological issues satisfactorily, and Professor Walton's book barely touches upon them. ■

Book Review
The Cell's Design
How Chemistry Reveals the Creator's Artistry

Fazale Rana
Baker Books, Grand Rapids, Michigan, 2008. 333 pp.
ISBN 978-0-8010-6827-0 **£9.00**

Reviewed by J H John Peet



One of the problems in speaking (or writing!) on creation and/or design, is the practice of taking one aspect of a structure and illustrating design in that. For example, we might talk about the peculiar aspects of the giraffe's neck with respect to its ability to get blood up to the brain without it dying of a blood haemorrhage when it drinks. Better is the study by Sylvia Baker where she explores the structure of the human eye in some breadth and depth (Baker, 2004).

Similarly, when we talk about the cell, we may spend time talking about the DNA, the production of proteins or the remarkable structure of the motors (such as ATP synthase, *etc*.). But, there is so much more to the cell. It is a highly integrated system. The evolutionist may challenge our claims to intelligent design in parts (almost always without convincing arguments), but when we look at the cell in its total form, demonstrating not just the many parts, but their finely balanced integration, we have an unanswerable demonstration of planning and creation.

This book by Rana is an excellent attempt at plugging this gap and, except for those who are experts in cell biology, most readers will find something new – and exciting! The experts will appreciate such a compact compendium on the subject.

The book is skilfully written (another demonstration of intelligent design!), gradually building up the case. Each chapter begins with an analogy from the world of art which illustrates the argument to be developed in the biological system.

I don't intend to go through the book in detail: that would mean a lengthy rewrite! Rather, I want to encourage you to read it for yourself. Yes, it is technical but I believe that anyone would be able to get at least a general understanding of the case being made. Those who want more information will find the notes and references to be an invaluable resource.

The introduction and first chapter establish the approach to be used to develop and demonstrate the argument. Chapter 2 describes the components that make up the cell and the following chapter lays the foundation for the rest of the book by outlining the biochemical processes which need to be explained. This immediately demonstrates the complexity of a living cell without having handled the detail!

In chapter 4, Rana looks at structures such us the flagellum, ATP-ase, bacteriophage, dynein. In these (as in the rest of the book), the author shows he is acquainted with the arguments of sceptics and answers them appropriately. Next he looks at the close link between DNA and the proteins in the cell and asks, which comes first?

After considering important aspects of chemical structure to the activity of the cell, he moves on to the intriguing "biochemical linguistics". We thought we knew more or less how the DNA could be read to produce a protein. It was neat and logical. Then came the complete analysis of the human genome and the apparent inadequacy of the DNA to produce the range of proteins required in a cell. Suddenly the story became more complex – and exciting! The genes are overlapping in the DNA and can even be read backwards to produce another protein. Try devising a sentence giving an instruction which can be read at different points (even beginning in the middle of a word) and also read backwards, each scheme giving a different and meaningful "recipe" for action. Impossible? Well, if you do succeed, I'd be interested in the example: but remember, it would have taken an intelligent mind to devise it! (There was a small section in this chapter 8 that I failed to get to grips with: "DNA is a parity code", but maybe I need to work on it a bit more!).

We then move on to consider the various biochemical processes linked to the genes and how they occur. Chapter 12 moves on to a specific area which is treated in a very cursory manner by evolutionists but, as Rana demonstrates, it is complex and intricate. He is describing the structure and function of the cell membranes. Most people have the impression that it is a simple structure based in two layers of lipids. But, when we see its functions, we begin to wonder how this simple layer can be so stable and specific. In fact, the two layers are not "carbon copies" of each other. They are asymmetric and each is very specifically constructed using a variety of lipids. Rana lists the basic functions as transporting materials in a single direction (whether into or out of the call), detecting changes in the environment outside the cell, performing specific chemical operations inside the cell and stabilising the membranes.

Of course, the evolutionist eventually comes back with the claim of bad design. The examples thrown up are too many to consider each in detail in the chapter, but the principles for tackling the issues are clearly laid out. Rana takes a few biochemical examples to illustrate how scientific research is showing the folly of making such claims when they amount to imperfect knowledge on our part. Each caused me to praise the Creator for His wisdom.

As a simplified demonstration of the principle, let me refer to his discussion of the so-called "futile cycle" of glycolysis. (Don't object to the inadequacy of my simplified answer: read Rana's fuller detail!). One compound, we'll call it A is converted to B in an energy-consuming process. But, the compound B is subsequently converted back to A, undoing the hard work of the first reaction. (Rana usefully compares it to a child undoing his mother's hard work cleaning and tidying a house!) What a wasteful system. But, recent research shows that both reactions are needed but the reverse one does not completely undo the first. For example, if the second reaction is slower than the first, then there is still a net useful process and, in fact, the cycle is essential to the cell.

The final chapters review the scheme presented throughout the book and the author lists the clear cut examples of design that he has presented. He lists twelve and then adds a further eight arguments that underline his thesis.

This is a well-written book and deserves a wide readership. It doesn't use theological arguments (which also affect our thinking about the nature of the Designer and the significance of man's rebellion to imperfection), but it does mean that it is a book that can be given to an unbeliever in intelligent design and creation. ■

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Editorial: Continued.

They could not comply with the new regime being enforced by King Charles II and the leaders of the Established Church.

These conscientious objectors were puritans: they wanted to see reform of the Established Church according to the Scriptures. The *Act of Uniformity* required them to give "unfeigned assent and consent to all and everything contained and prescribed" in the *Book of Common Prayer.* Furthermore, they were required also to swear an oath never to "endeavour any change or alteration of government either the church or state." St. Bartholomew's Day was chosen to provide an additional financial incentive to conform: this was the day when tithes and rents were payable, in arrears, to members of the clergy. Subsequently, dissenters faced legally enforced penalties: they were spied on, summoned before judges, fined, and some were sent to Virginia to do hard labour on the plantations. This was a time of persecution, when people of integrity suffered for conscience sake. Yet their Christian spirit and willingness to persevere through affliction was a tremendous witness to the whole nation. They inspired their generation and made an enduring impression on British Christians.

Furthermore, they were ultimately victorious! The Act of Toleration eventually came. Subsequently, the principle of liberty of conscience was recognised and widely accepted in British society. Those outside the Church of Christ have come to appreciate the preciousness of freedom of speech and religious liberty. We need to remind ourselves of the heritage left by those who stood firm in 1662 – we only have to look around the world to find countries and cultures that despise such liberties and where dissenters have a hard time. Today, Britain is in the grip of secularism and many of these hard-won liberties are being snatched away. Most of the issues they are targeting have relevance to the early chapters of Genesis: we have already noted examples of abortion, homosexuality, marriage and evolutionary accounts of origins. The secularists are seeking legal endorsement for their policies, so that all dissent is deemed to be a case of discrimination or religious bigotry. We need to hear God's word for our generation. We need to be ready to stand when the going gets tough. We should be encouraged by those who have made sacrifices for conscience sake – and were ultimately vindicated by God. We need to pray for wisdom about what battles the Lord calls us to fight. ■

David J. Tyler

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Credits and Acknowledgments

Design by DesignLeft.
www.designleft.co.uk

Printed by Harcourt Colour Print, Swansea.

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ISSN 0953-2773

Origins is published three times a year by *The Biblical Creation Society*

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